Application No. 10/019,370 Amendment dated September 8, 2003 Reply to Office Action of May 30, 2003

Amendments to the Claims

The following listing of claims will replace all prior versions and listings of the claims in the

application:

Claims 1-21 (canceled).

Claim 22 (new): A computer-implemented system for analyzing nuclear magnetic resonance data,

wherein the data contains at least one relaxation signal of a sample, the system comprising:

at least one analyzing means that separates the data into at least two parts that are differently

dependent on an echo time T_E.

Claim 23 (new): The computer-implemented system of claim 22, wherein said analyzing means

separates the data into at least one part that is dependent on the echo time T_E and into at least another

part that is not dependent on the echo time T_E, and said analyzing means acquires the data that is

dependent on the echo time T_E as activation signals.

Claim 24 (new): A nuclear magnetic resonance tomograph comprising:

a computer-implemented system for analyzing nuclear magnetic resonance data, wherein the

data contains at least one relaxation signal of a sample, said computer-implemented system including

at least one analyzing means that separates the data into at least two parts that are differently

dependent on an echo time T_E.

Claim 25 (new): A computer-implemented method for analyzing nuclear magnetic resonance data,

wherein the data contains at least one relaxation signal of a sample, the method comprising:

280932 1.DOC

Page 3 of 9

separating the data into at least two parts that are differently dependent on an echo time T_E.

Claim 26 (new): The computer-implemented method of claim 25, wherein the separating step comprises separating intensity values of the data into at least two parts that are differently dependent

on the echo time T_E.

Claim 27 (new): The computer-implemented method of claim 26, further comprising calculating a

statistical variation of the intensities.

Claim 28 (new): The computer-implemented method of claim 27, further comprising calculating a

standard deviation of the intensities.

Claim 29 (new): The computer-implemented method of claim 25, wherein the separating step

comprises separating the relaxation signal into at least one part that is dependent on the echo time T_E

and into at least another part that is not dependent on the echo time T_E.

Claim 30 (new): The computer-implemented method of claim 25, further comprising calculating at

least one signal that is proportional to $T_E \exp(-T_E/T_2)$.

Claim 31 (new): The computer-implemented method of claim 30, further comprising calculating T₂.

with the formula $S = S_0 \exp(-T_E / T_2) + g$.

Application No. 10/019,370
Amendment dated September 8, 2003
Reply to Office Action of May 30, 2003

Claim 32 (new): The computer-implemented method of claim 25, further comprising calculating

statistical fluctuations of ΔT_2 .

Claim 33 (new): The computer-implemented method of claim 32, further comprising calculating a

standard deviation $\sigma(\Delta T_2^*)$.

Claim 34 (new): The computer-implemented method of claim 33, further comprising calculating a

quotient $\sigma(\Delta T_2 \mbox{'}) \, / \, T_2 \mbox{'}$ that represents a measure of an activity.

Claim 35 (new): The computer-implemented method of claim 25, further comprising calculating a

statistical deviation of an initial intensity S_0 .

Claim 36 (new): The computer-implemented method of claim 35, further comprising calculating a

standard deviation $\sigma(\Delta T_2^{\bullet})$.

Claim 37 (new): The computer-implemented method of claim 36, further comprising calculating a

quotient $\sigma(\Delta S_0) / S_0$.

Claim 38 (new): The computer-implemented method of claim 25, further comprising calculating a

statistical fluctuation of a noise signal g.

Claim 39 (new): The computer-implemented method of claim 38, further comprising calculating

280932_1.DOC

Application No. 10/019,370 Amendment dated September 8, 2003 Reply to Office Action of May 30, 2003

a standard deviation $\sigma(g)$ of the noise signal g.

Claim 40 (new): The computer-implemented method of claim 25, further comprising acquiring the data in a two-dimensional field, wherein a field axis (DTE) acquires the echo times T_E , and another field axis (DTR) reproduces repetitions of excitations at a time interval T_R .

end

Claim 41 (new): The computer-implemented method of claim 40, further comprising calculating a standard deviation $\sigma(\Delta T_2)$ and a standard deviation $\sigma(g)$ of a noise signal g using the following steps:

- (i) averaging signals over DTR to an exponential decay as a function of DTE and determining S_0 and T_2 ;
- (ii) calculating $\sigma(\Delta S_0)$, $\sigma(\Delta T_2)$ and $\sigma(g)$ for several voxels and different T_E , followed by averaging these values over at least one region of interest (ROI);
 - (iii) calculating

$$\frac{\sigma(\Delta S)}{S_0} = \left\{ \left[\left(\frac{T_E}{T_s^*} \right)^2 \left(\frac{\sigma(\Delta T_2^*)}{T_2^*} \right)^2 + \left(\frac{\sigma(\Delta S_0)}{S_0} \right)^2 - 2 \frac{T_E}{T_2^*} \frac{\left(\Delta S_0 \Delta T_2^*\right)}{S_0 T_2^*} \right] \varepsilon^{-2T_E/T_2^*} + \left(\frac{\sigma(g)}{S_0} \right)^2 \right\}^{1/2}; \text{ and}$$

(iv) determining $\sigma(\Delta S)$ / S_0 as a function of T_E .

Claim 42 (new): The computer-implemented method of claim 41, wherein the expression $\langle \Delta S_0 \Delta T_2^* \rangle = 0$ is used for the calculation of $\sigma(\Delta S_0)/S_0$.